

# Road Safety in the Primary Curriculum

## Year 4

### Lesson Plan - 'Egg-Helmet' Experiment

#### Learning Outcomes

- Pupils will have learned how to set up a scientific experiment and the importance of making it a 'fair test'.
- From the results pupils should be able to deduce whether cycle helmets work.
- Pupils will have discovered the best materials for making cycle helmets.
- Pupils will be aware of cycle-helmet wearing rates and why they are so low.



## Introduction (Whole Class)

Compare the structure of an egg with that of the head. (Brain = yoke; skull = shell etc.,) The function of the brain, and the function of the yolk are both vital.

#### Experiment:

##### Aim

To test the effectiveness of different materials for making cycle helmets

##### Explanation

Explain to class:

We will be wrapping raw eggs in different materials, then dropping them and measuring breakage.

##### Fair Test

Discuss and come to agreement with class about making the test fair e.g. 1 layer of material perhaps; drop from measured height; drop, don't throw so no additional force other than '?' (gravity)

##### Prediction

RULE: Pupils to predict the amount of breakage before dropping their eggs

##### Method (In pairs)

- Each pair selects a material to wrap an egg (e.g. tin foil, cling film, paper, cloth, plastic sheet, bubble wrap, tissue, corrugated cardboard, polystyrene). Wrap the eggs according to 'fair test' agreement fixing with sellotape.
- Each pair comes forward to front of class, predicts what will happen to their egg, then drops it into a bucket, according to the 'fair test' agreement.
- (NB Have a rubbish sack and plenty of paper towels to hand!)
- All children agree level of breakage

(LEARNING OUTCOME: *Pupils will have learned how to set up a scientific experiment and the importance of making it a 'fair test'*)

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Record results on whiteboard:

Material	Prediction	Breakage	Material Rating
Paper	Crack	Smashed	Poor

Conclusion:

Pupils should find that corrugated cardboard, bubble wrap and sheet poly-styrene protect the egg best.

(LEARNING OUTCOME: From the results pupils should be able to deduce whether cycle helmets work)

Whole class Discussion:

Discuss if these are good materials for making cycle helmets.

e.g. What happens to cardboard when it gets wet? What happens to bubble-wrap if left around?

What does bubble-wrap become once all the bubbles have been popped?

This should end up with polystyrene being the best material!!!

(LEARNING OUTCOME: *Pupils will have discovered the best material for making cycle helmets*)

Demonstration:

Use 'egg-helmet'.

With marker pen draw face on egg, put egg-helmet on the egg and do up the chinstrap, drop it in the bucket – hey presto! – it doesn't break!!

(LEARNING OUTCOME: *Confirms that polystyrene is the best material for making cycle helmets*)

***To obtain egg-helmets along with instruction sheet, please see Teacher Guidance Notes for details***

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#### Survey (by show of hands):

Ask the following and record the results:

- Who owns a bike?
- Who owns a cycle helmet?
- Who always wears their helmet every time they ride their bike?

(Likely results are 100% bike owners, 50% helmet owners, 5% wear their helmet)

Discuss these results and **why** cyclists don't wear their helmets.

Has anyone changed their mind following the results of the egg-helmet experiment?

(LEARNING OUTCOME: Pupils will be aware of cycle-helmet wearing rates and why they are so low)

#### Ideas for follow-up work:

- 'Design a helmet you would wear'
- Perhaps make a prototype, write and/or send your design to a cycle helmet manufacturer.
- Do a survey across the whole school.